

# Unit 1 Review

# History of CEA

# Architecture

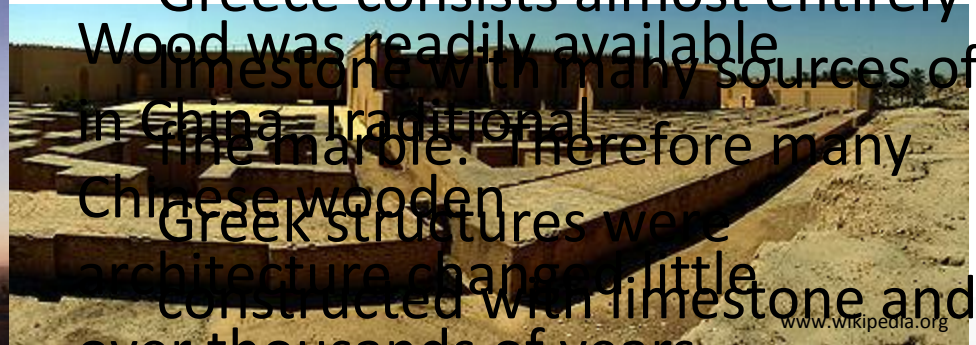
- Architectural style is often an important key to understanding how a community developed
- Architectural style helps show how aesthetic customs have formed over time
- EX: steel not used much until industrial revolution

# Building Materials

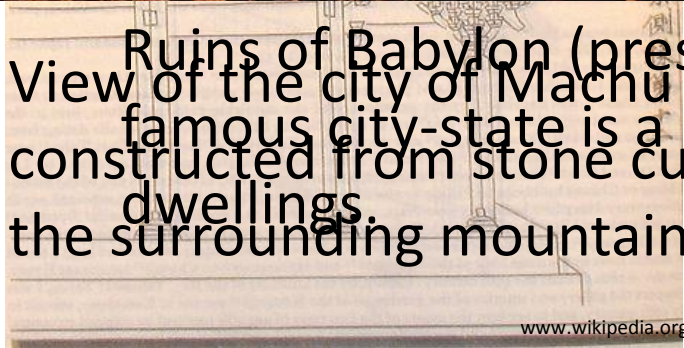
Materials were chosen based on availability and climate.



Greece consists almost entirely of limestone with many sources of fine marble. Therefore many Greek structures were constructed with limestone and marble.



Ruins of Babylon (present day Iraq). All that remains of the famous city-state is a mound of broken mud-brick dwellings.

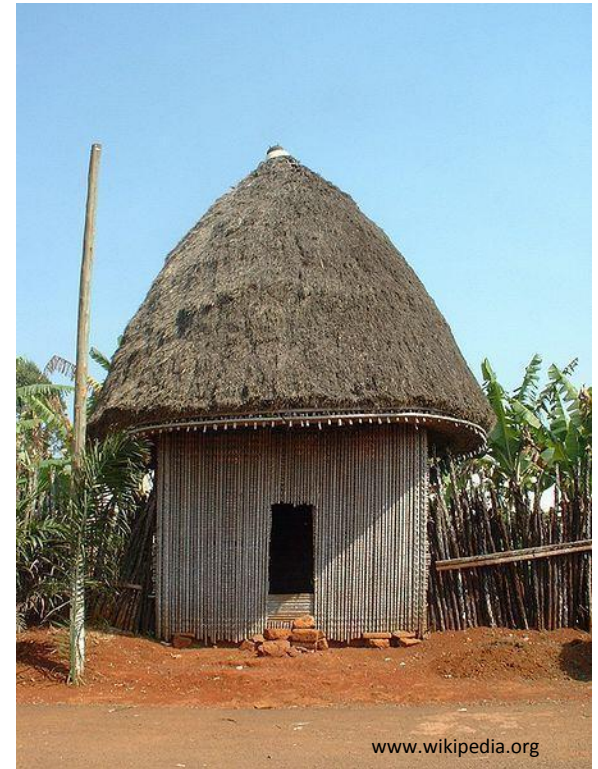


# Vernacular Architecture

Methods of construction that use **locally available resources and traditions to address local needs.**



An igloo, an Inuit winter dwelling



African Hut at Bana, a small village of Cameroon

# Visual Design Elements

Six integral components used in the creation of a design:

Line

Space

Color

Texture

Form and Shape

Value

# Line

## Types

Vertical – Represents dignity, formality, stability, and strength

Horizontal – Represents calm, peace, and relaxation

Diagonal – Represents action, activity, excitement, and movement

Curved – Represents freedom, the natural, having the appearance of softness, and creates a soothing feeling or mood



# Vertical Lines

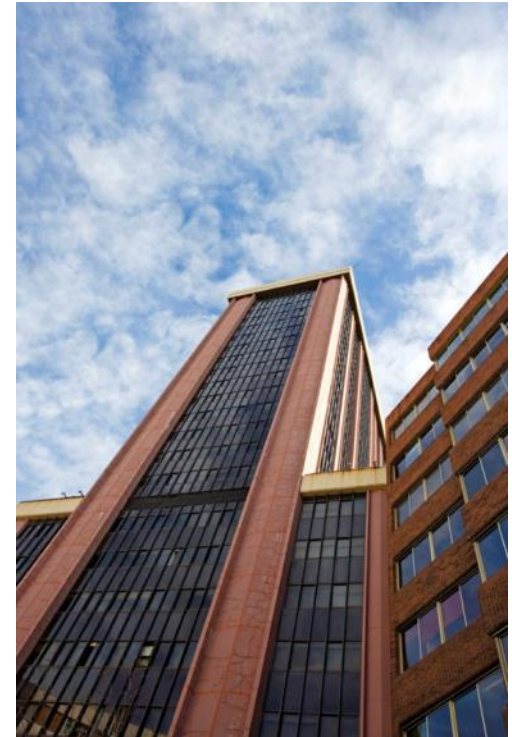


The Empire State Building  
Architect: Shreve, Lamb,  
and Harmon



Microsoft Office clipart

Brandenburg Gate  
Berlin



Skyscraper  
Madrid, Spain



# Horizontal Lines



Community Christian Church  
Kansas City, MO  
Architect: Frank Lloyd Wright, 1940

# Diagonal Lines



# Curved Lines



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Sydney Opera House  
Jorn Utzon

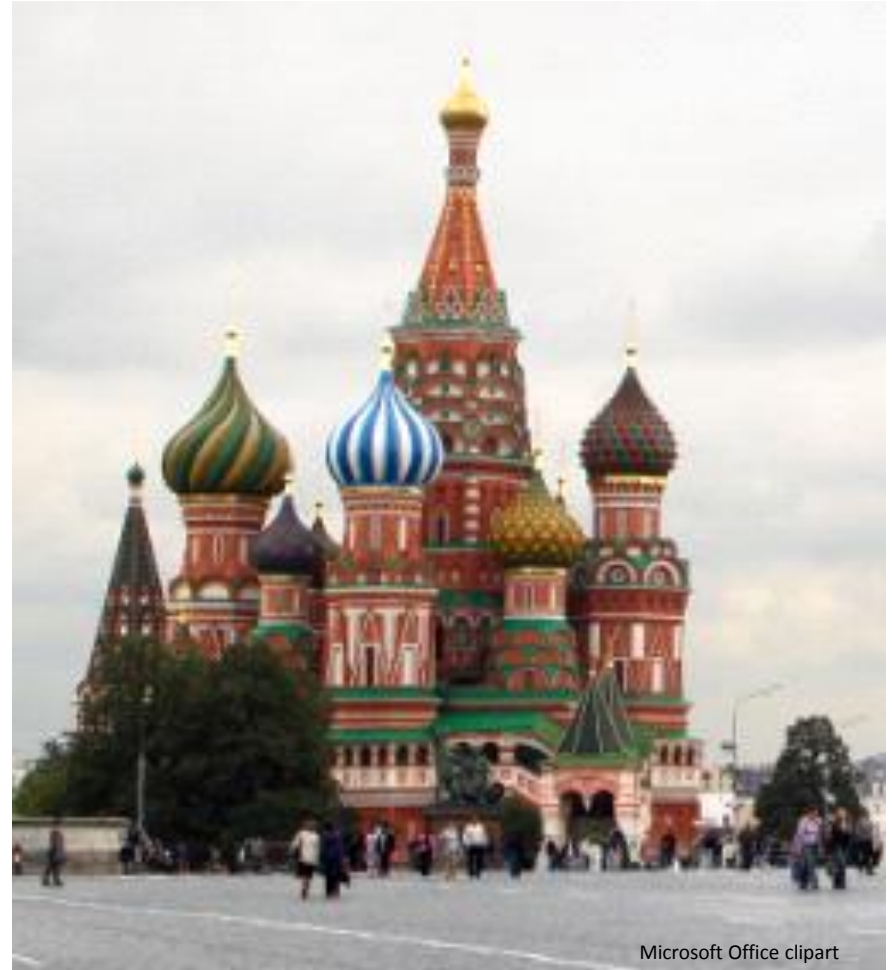


# Color

Color has an immediate and profound effect on a design.



Microsoft Office clipart



Microsoft Office clipart

Saint Basil's Cathedral  
Moscow

# Form and Shape

**Form:** (3D) The shape and structure of something as distinguished from its substance or material.

**Shape:** (2D) The two-dimensional contour that characterizes an object or area.

# Space

By incorporating the use of space in your design, you can enlarge or reduce the visual space.

## Types

- Open, uncluttered spaces
- Cramped, busy spaces
- Unused vs. good use of space





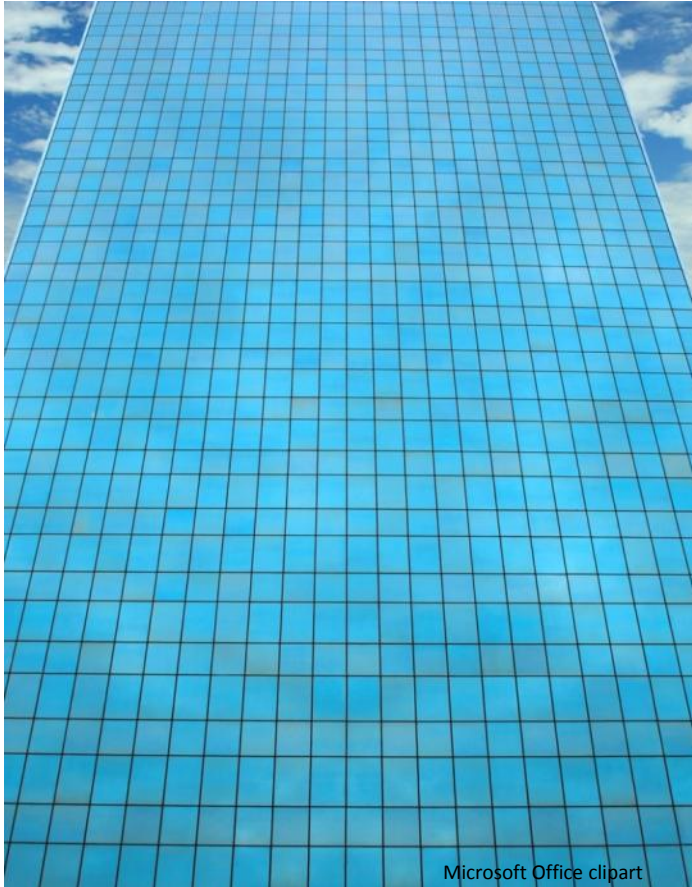
# Texture

The surface look or feel of something

Smooth Surface – Reflects more light and therefore is a more intense color.

Rough Surface – Absorbs more light and therefore appears darker.

# Smooth Texture



Glass façade of a high rise  
office building



Exterior metal façade of Disney Concert Hall  
Los Angeles

# Value

The relative lightness or darkness of a color



## Methods

Shade – Degree of darkness of a color

Tint – A pale or faint variation of a color

# Value



Downtown buildings in Bangalore, India

# Visual Design Principles

Seven principles encompass an interesting design.

- Balance
- Rhythm
- Emphasis
- Proportion and scale
- Movement
- Contrast
- Unity

# Balance

Parts of the design are equally distributed to create a sense of stability. Both physical and visual balance exist.

## Types

- Symmetrical or formal balance
- Asymmetrical or informal balance
- Radial balance
- Vertical balance
- Horizontal balance



# Balance

## Symmetrical or Formal Balance

The elements within the design are identical in relation to a centerline or axis.



The Taj Mahal Mausoleum  
Agra, Uttar Pradesh, India

# Balance

## Asymmetrical or Informal Balance

Parts of the design are not identical but are equal in visual weight.



Chateau de Chaumont  
Saone-et-Loire, France

# Balance

## Radial Balance

Design elements radiate outward from the center.



Dresden Frauenkirche  
Dresden, Germany



Galleria Vittorio Emanuele II  
Milan, Italy  
Architect: Giuseppe Mengoni



# Rhythm

## Regular Rhythm

An element is repeated at the same repetition/interval each time.

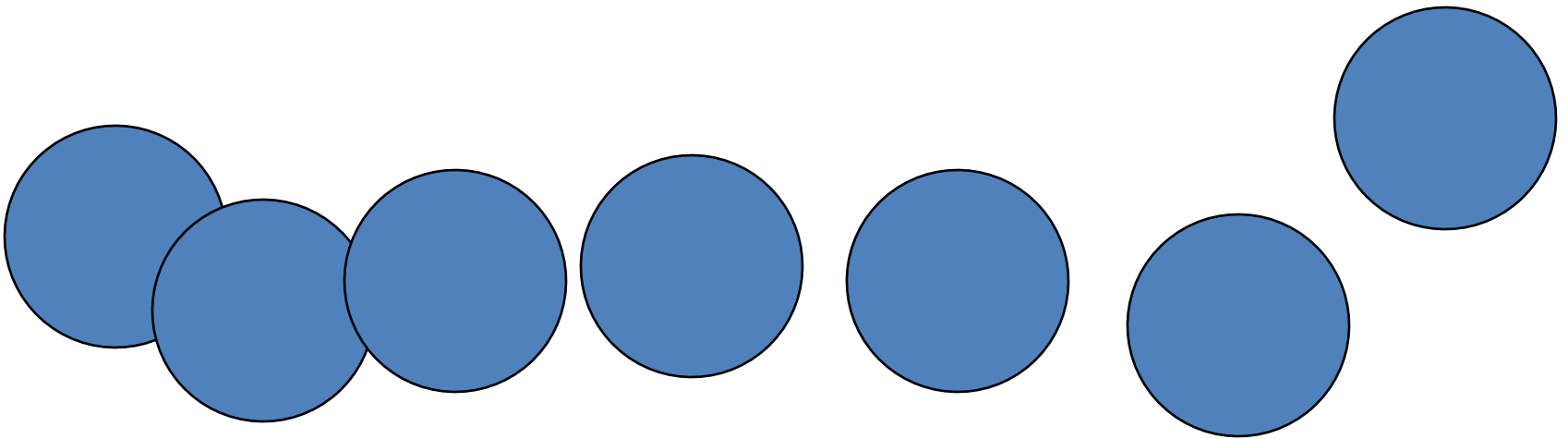


Cube house design  
Rotterdam, Netherlands

# Rhythm

## Graduated Rhythm

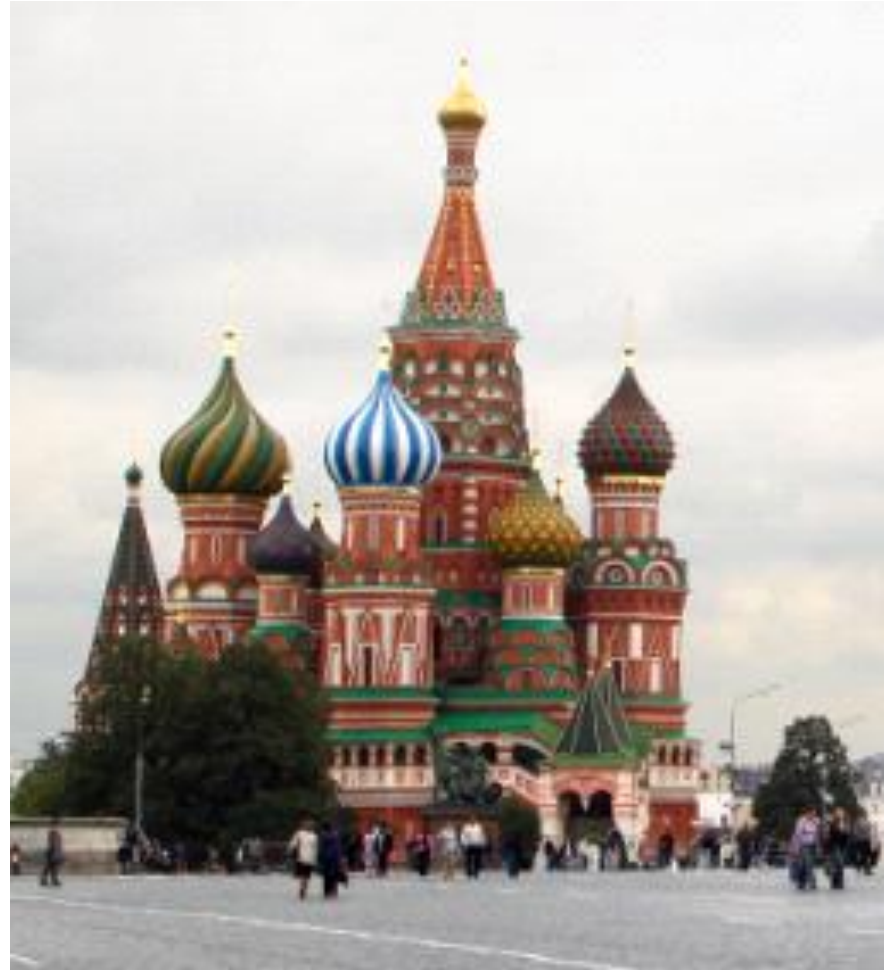
The beats of the element become closer or farther apart as they move.



# Rhythm

## Random Rhythm

The beats of the element are random or are at irregular intervals.





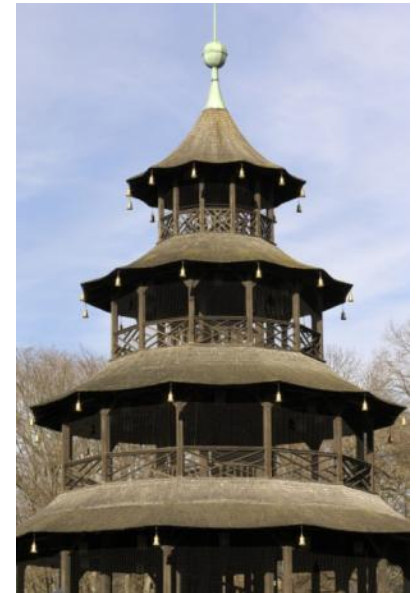
# Rhythm

## Gradated Rhythm

The repeated element is identical with the exception of one detail increasing or decreasing gradually with each repetition.



[www.wikimedia.org](http://www.wikimedia.org)



Microsoft Office clipart

# Emphasis

The feature in a design that attracts one's eye – the focal point

- Emphasis can be achieved through size, placement, shape, color, and/or use of lines





# Movement

Flow or feeling of action



# Contrast

Noticeably different

Can be created with

- Color
- Proportion and scale
- Shape
- Texture
- Etc.



# Unity

Unity is achieved by the consistent use of lines, color, material, and/or texture within a design.



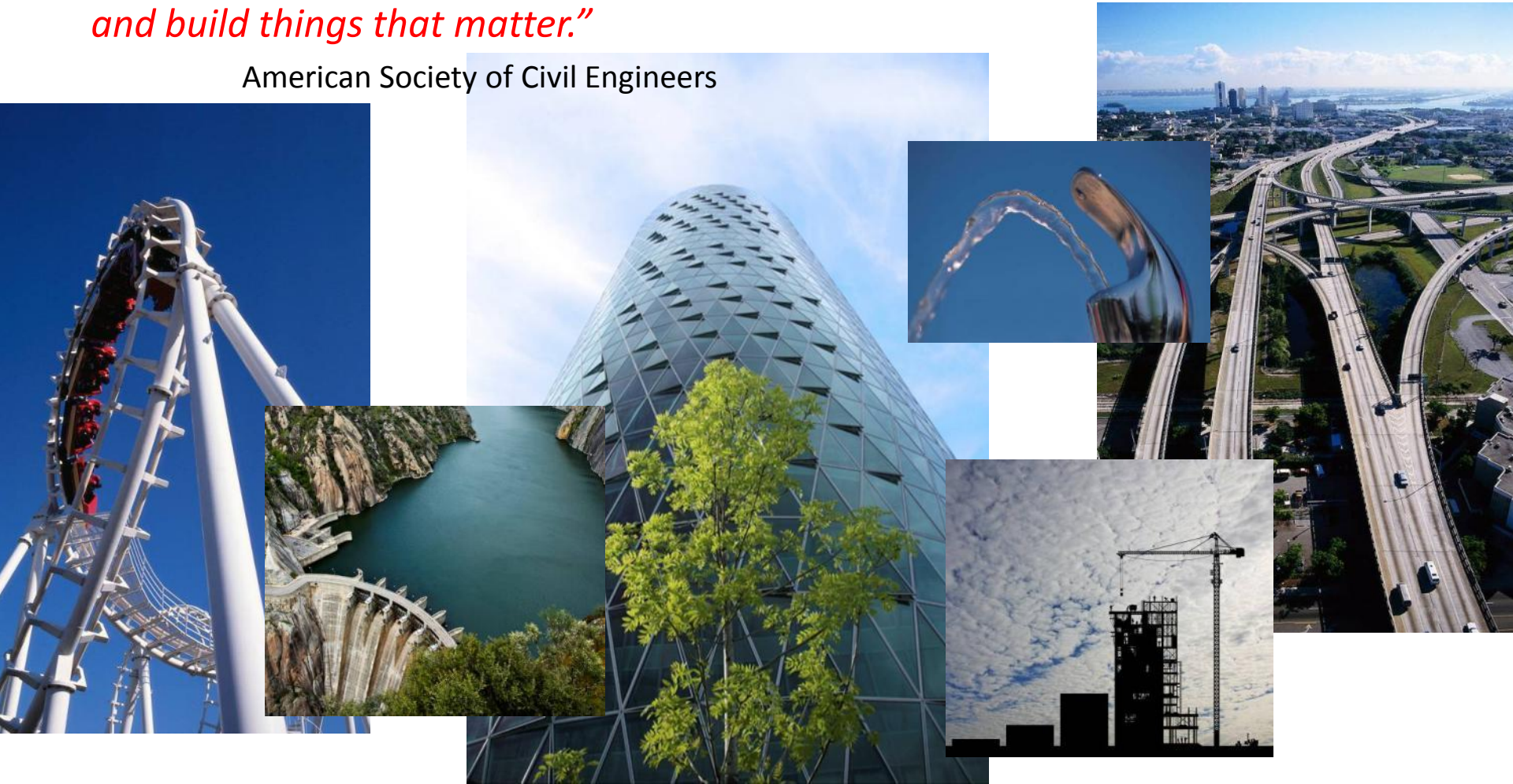
# Careers in CEA



# What is Civil Engineering?

*“Civil engineers are changing the world. They dream up creative, practical solutions that benefit the everyday lives of people and the communities in which we live. They work with smart and inspiring people to invent, design and build things that matter.”*

American Society of Civil Engineers



# About Civil Engineering

- Civil engineers are wherever people build anything. Some work in offices or labs, and many work at construction sites.
- Civil is the largest field of engineering in the United States.
- 193 Universities offer ABET accredited civil engineering programs.
- Civil engineering is one of the oldest engineering career fields.
- The American Society of Civil Engineers ([www.asce.org](http://www.asce.org)) is a professional organization for civil engineers.

# About Civil Engineering

- Civil engineering is a diverse field. Most specialties fall under the categories of
  - Structural
  - Environmental
  - Geotechnical
  - Water Resources
  - Transportation
  - Construction
  - Urban Planning





# What is Architecture?

*“Architecture is the thoughtful making of space.”*

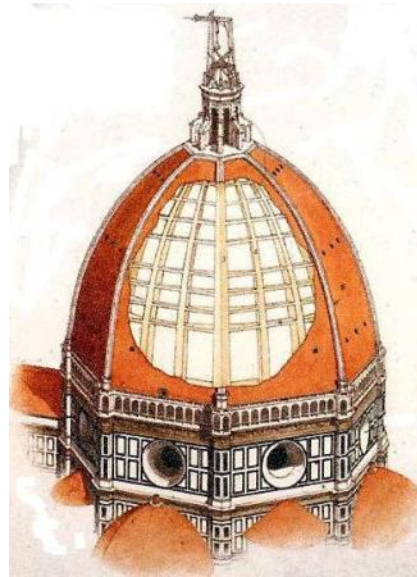
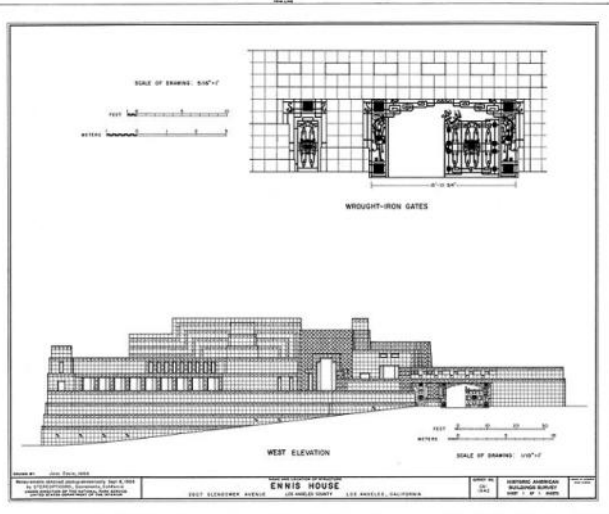
- Louis Kahn



# What is Architecture?

*“Architecture is the imaginative blend of art and science in the design of environments for people. People need places to eat, work, live and play. Architects transform these needs into concepts and then develop the concepts into building images that can be constructed by others.”*

- ARCHcareers.org



# About Architecture

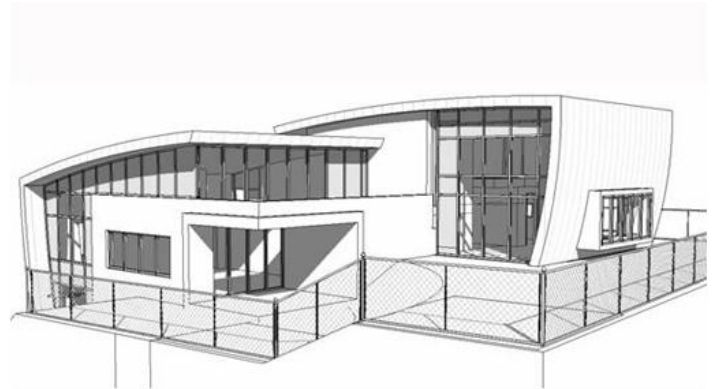
Architects are licensed professionals trained in the art and science of building design who develop the concepts for structures and turn those concepts into images and plans. They typically design facilities intended for human habitation





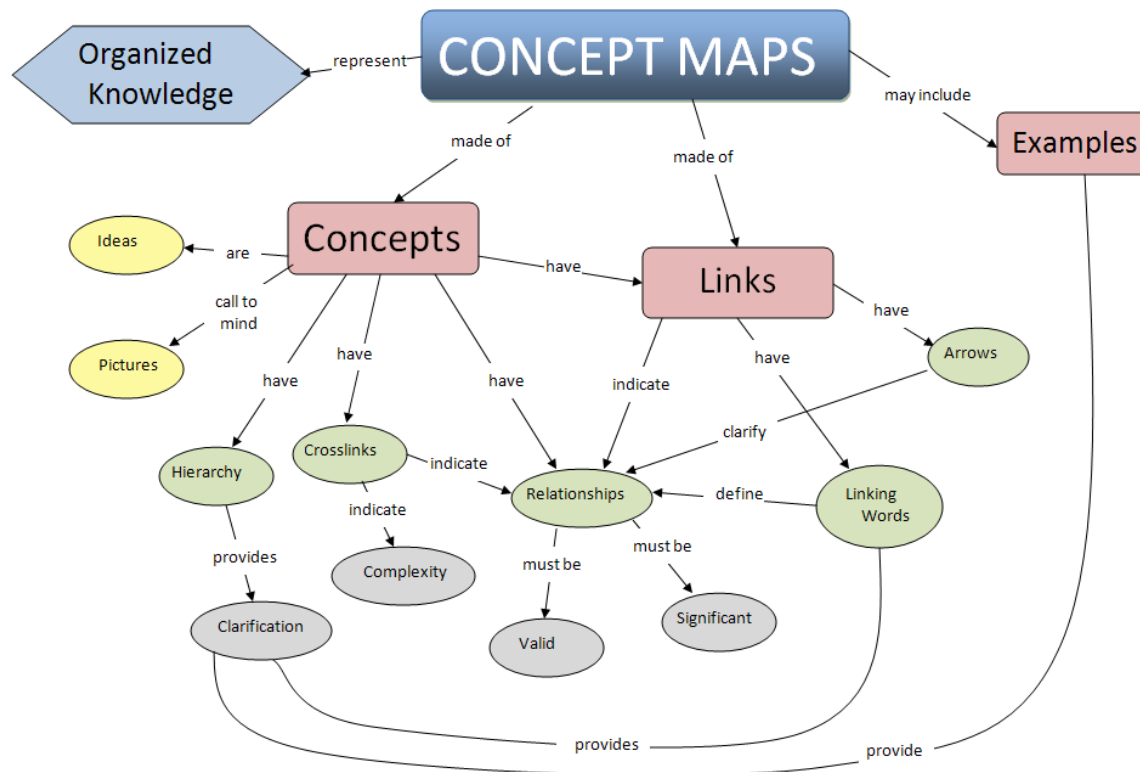
# About Architecture

- About 1 in 5 architects is self employed.
- A license is required to serve as a practicing architect.
- Licensing involves earning a professional degree from an NAAB approved school, at least 3 years experience, and passing Architect Registration Exams.
- Employment is expected to grow faster than other occupations, but competition for the most prestigious jobs is fierce.



# What Is Concept Mapping?




A graphic organizer that shows relationships among connected concepts and ideas.





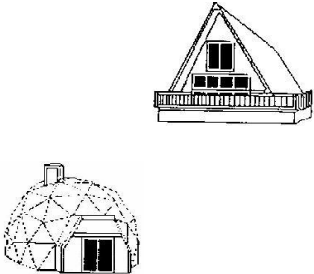

# Charrette

- Method for brainstorming possible solutions
- Involves collaboration of many stakeholders with a variety of skills
- Organized meeting

# Architectural Styles

	<b><u>Style</u></b>	<b><u>How do you recognize it?</u></b>	<b><u>When was it used?</u></b>
	<b>Art Deco</b>	A vertically oriented design includes flat roofs, metal window casements, stained glass.	1925-1940
	<b>Arts and Crafts (Craftsman)</b>	Full- or partial-width porches are framed by tapered columns and overhanging eaves. stone, exterior chimney small, high windows on each side of chimneys dormers, usually gabled or shed triangular knee brace supports sloped foundations	1910-1930's
	<b>Bungalow</b>	narrow, rectangular one and one-half story houses with low-pitched, gabled or hipped roofs and small covered porches at the entry.	1880's in Ca. through depression



	<b>Cape Cod</b>	gabled roofs and unornamented fronts.	1940's and 1950's
	<b>Contemporary</b>	odd-sized windows and little ornamentation.	
	<b>Counter Culture</b>	Commonly A-frames or geodesic domes – distinctive or unusual features predominate	1960-1970
	<b>Cubic</b>	Square floor plan and cubic volume, this style is very plain and has only simple front porches, if any.	Early 20 <sup>th</sup> century



### **Dutch**

Roof shape identifies this house style! These have symmetrical windows and floor plans.

1905-1935

### **English**

rectangular design and second-floor bedrooms.



### **Farmhouse**

Simple, box-shaped, steep pitched roof to shed snow. Central chimney used to support the frame



### **Federal**

Builders began to add swags, garlands, elliptical windows, and other decorative details to rectangular Georgian houses.



### **French**

Balance and symmetry define the French Provincial style, which has a steep hip roof

1900-1930





**Garrison**

2 ½ story, symmetrical house with the second-story overhang in the front and Exterior chimney at the end

1935-1955



**Georgian**

With paired chimneys and a decorative crown, this style was named after English royalty.



**Greek Revival**

Entryway columns and a front door surrounded by rectangular windows are characteristic.

1840 to 1890's



**International**

International style exposes functional building elements, including elevator shafts.

1930's to 1960's



## I-Style

This 1 room deep, 2 room wide, 2 story structure looks like a capital "I". These very skinny, tall houses almost always lack decorative details.

1820-1880's in farms and middle class neighborhoods



## Italianate

symmetrical bay windows in front, small chimneys, and tall windows.

1840's to 1870's



## Modern

Similar to international style, these houses really don't include much "style" at all; ranch, raised ranch, split-level, and "sea ranch" after the 1950s

1950-1980



## Neo-eclectic

Dressed up ranches, built to conserve energy, tall houses with vaulted ceilings

1980's

Megalith stone system



## Neolithic

cave dwelling, wattle and daub simple dwelling construction combined with timber and huge erected stones – Ex Stonehedge

7000-3000 BC



## Normandy Style

Central turret with door,  
massive chimneys, steep  
complicated roofs

1900-1930



## Prairie Style

Roofs are low-pitched, with  
wide eaves; rows of casement  
windows; one-story porches  
with massive square supports;

1900-1950's



## Queen Anne

Steep cross-gabled roofs,  
towers, and vertical windows.  
Inventive, multistory floor plans  
often include projecting wings,  
several porches, balconies,  
multiple chimneys with  
decorative chimney pots.




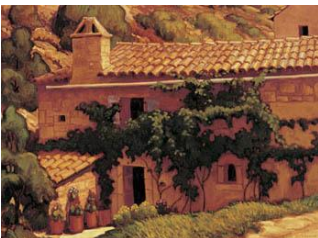
1880's to 1890's






## Ranch

pitched-roof construction, built-  
in garages, and picture  
windows.



	<b>Saltbox</b>	<p>A step roofline often plunges from two and one-half stories in front to single story in rear. Large central chimney and large, double-hung windows with shutters.</p>	
	<b>Shed</b>	<p>Subset of the Modern style, Shed houses are asymmetric with sloping roofs.</p>	1960's and 1970's
	<b>Southern Colonial</b>	<p>Brick or timber-framed structure with simple "saltbox form" and steeply pitched gable roof. Often only 1 room deep ; massive chimneys at each end of house</p>	1600-1700
	<b>Spanish (Eclectic)</b>	<p>Usually have low-pitched tiled roofs, white stucco walls, and rounded windows and doors. May have scalloped windows and balconies with elaborate grillwork, decorative tiles around doorways and windows, bell towers.</p>	

	<b>Split Level</b>	<p>The midlevel, which usually jutted out from the two-story section, offered "quieter" quarters, such as the living and dining rooms; and area above the garage was designed for bedrooms.</p>	<p>1950's and 1960's</p>
	<b>Tudor</b>	<p>Half-timbering is featured on bay windows and upper floors, and steep cross gables.</p>	<p>1900's -1930's</p>
	<b>Victorian</b>	<p>Ornamentation such as brackets, spindles, and patterned shingles, curved towers and spindled porches</p>	<p>1870 to 1900's</p>